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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,524	02/26/2002	Pidugu Narayana	MAPL-00303	7717

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EXAMINER	
MAIS, MARK A	

ART UNIT	PAPER NUMBER
2616	

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,524	NARAYANA ET AL.	
	Examiner	Art Unit	
	Mark A. Mais	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 26 February 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 19 June 2002.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) from provision application 60/271,805 filed on February 26, 2001 is acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) was filed together with the application on February 26, 2002. The submission is in compliance with the provisions of 37 C.F.R. 1.97. According, the examiner considered the IDS.

Specification

3. The disclosure is objected to because of the following informalities: it contains incomplete references to U.S. Patent Applications and/or Patents. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Nadj et al. (USP 6,952,696).

6. With regard to claim 1, Nadj et al. discloses a method of scheduling data packet transmission in a data communication network, comprising:

assigning received data packets to an appropriate one of a plurality of scheduling heap data structures **[Pile-type heaps are used to implement scheduling queues, col. 5, lines 34-35; Figs. 5-7; specifically, packet scheduling (equal, weighted, etc.) is accomplished by using a more efficient memory solution and is especially useful in high-speed links/processing, col. 5, lines 34-39]**;

percolating each scheduling heap data structure to identify a most eligible data packet in each heap data structure **[percolation in heap data structures necessarily involves identification of the highest (or lowest) value/priority (interpreted as most eligible); thus, the root node is found, the highest priority node is found, and then replaced with a hole, col. 9, lines 32-34; *see also* col. 1, lines 20-32 which defines the fundamental/properties of a heap structure]**;

prioritizing among the most-eligible data packets **[interpreted as performing a prioritization process which results in a "winner", col. 11, lines 29-34]**; and

transmitting a highest-priority one of the most-eligible data packets **[this allows the implementation to have increased throughput (for implementations such as schedulers which involve priority queues, weighted fair queuing (claim 4), and other types of traffic shaping), col. 5, lines 17-26; this is further interpreted as by the examiner as equal queuing (claim 5) which involves either same priority levels (claim 5) or no priority levels (claim 6), and moves the values in the nodes according to heap theory in a direction such as, for example, from the bottom-most left to the top as the nodes values (e.g., arrival times) arrive in the heap, col. 1, lines 20-32]**.

7. With regard to claim 10, Nadj et al. discloses a system for scheduling data packet transmission comprising

a plurality of scheduling heap data structures having a plurality of levels for storing scheduling values for data packets according to their relative priorities **[Pile-type heaps are used to implement scheduling queues, col. 5, lines 34-35; Figs. 5-7; specifically, packet scheduling (equal, weighted, etc.) is accomplished by using a more efficient memory solution and is especially useful in high-speed links/processing, col. 5, lines 34-39]**; and

a scheduler for each heap data structure **[the scheduler is interpreted as the logical implementation of the multiple memory systems that comprise the pipelined implementation of the heap data structure which represent each level of the multiple levels of the data structure for a heap—or multitude of heaps that form supernodes,**

col. 6, lines 59-64; *see also* Figs. 9, 11-12, col. 10, lines 41-45, col. 11, lines 23-27, and col. 13, lines 31-34], each scheduler for identifying a most-eligible one of the scheduling values in the corresponding heap data structure **[percolation in heap data structures necessarily involves identification of the highest (or lowest) value/priority (interpreted as most eligible); thus, the root node is found, the highest priority node is found, and then replaced with a hole, col. 9, lines 32-34; *see also* col. 1, lines 20-32 which defines the fundamental/properties of a heap structure]**; and

a master scheduler coupled to each of the schedulers for selecting a highest priority one of the most-eligible scheduling values **[the scheduler is interpreted as the logical implementation of the multiple memory systems that comprise the pipelined implementation of the heap data structure which represent each level of the multiple levels of the data structure for a heap—or multitude of heaps that form supernodes, col. 6, lines 59-64; *see also* Figs. 9, 11-12, col. 10, lines 41-45, col. 11, lines 23-27, and col. 13, lines 31-34; thus, in a pipelined heap, the master scheduler is interpreted as the first level in the of the heap data structure]**.

8. With regard to claim 11, Nadj et al. discloses that a queue controller for each heap data structure for manipulating scheduling values in the corresponding heap data structure **[interpreted as the logic blocks which perform the heap insert and heap remove operations that performed within each of the pipelined heap structure levels, *see also* Figs. 9, 11-12, col. 10, lines 41-45, col. 11, lines 23-27, and col. 13, lines 31-34]**.

9. With regard to claims 2 and 12, Nadj et al. discloses that the percolating arranges the data packets in each heap data structure according to assigned priority levels **[percolation in heap data structures necessarily involves identification of the highest (or lowest) value/priority (interpreted as most eligible); thus, the root node is found, the highest priority node is found, and then replaced with a hole, col. 9, lines 32-34; *see also* col. 1, lines 20-32 which defines the fundamental properties of a heap structure]**.

10. With regard to claims 3 and 13, Nadj et al. discloses that the selected data packets are arranged based on anticipated arrival times for the data packets **[examiner interprets anticipated arrival time arrangement as the one disclosed wherein the supernode structure allows the speculative read functionality to be performed even before the exact value for selected packets is known (which *necessarily* affects both arrangement and percolation), col. 9, lines 14]**.

11. With regard to claims 4-6 and 14-16, Nadj et al. et al. discloses that the selected data packets are arranged using weighted fair queuing. 5. The method according to claim 3, wherein the selected data packets have a priority value equal to that of a priority value of another data packet. 6. The method according to claim 3, wherein the selected data packets lack a priority value **[the heap sorting method disclosed is used in implementations such as schedulers which involve priority queues, weighted fair queuing, and other types of traffic shaping, col. 5, lines 17-26; this is further interpreted as by the examiner as equal queuing which involves either same priority levels or no priority levels, and moves the values in the nodes according to heap**

theory in a direction such as, for example, from the bottom-most left to the top as the nodes values (e.g., arrival times) arrive in the heap, col. 1, lines 20-32].

12. With regard to claims 7 and 17, Nadj et al. discloses that the percolating arranges the data packets in each heap data structure in order of anticipated arrival times for the data packets **[examiner interprets anticipated arrival time arrangement as the one disclosed wherein the supernode structure allows the speculative read functionality to be performed even before the exact value for selected packets is known (which *necessarily* affects both arrangement and percolation), col. 9, lines 14].**

13. With regard to claims 8 and 18, Nadj et al. discloses that the percolating arranges the data packets in each heap data structure using weighted fair queuing **[the heap sorting method disclosed is used in implementations such as schedulers which involve priority queues, weighted fair queuing (claims 8 and 18), and other types of traffic shaping, col. 5, lines 17-26].**

14. With regard to claims 9 and 19, Nadj et al. discloses that the weighted fair queuing is based on anticipated arrival times for the data packets **[examiner interprets anticipated arrival time arrangement as the one disclosed wherein the supernode structure allows the speculative read functionality to be performed even before the exact value for selected packets is known (which *necessarily* affects both arrangement and percolation), col. 9, lines 14].**

Claim Rejections - 35 USC § 102

15. Claims 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kadambi et al. (USP 6,952,401).

16. With regard to claims 20-23, Kadambi et al. discloses a method of scheduling data packet transmission in a data communication network **[Pile-type heaps are used to implement scheduling queues, col. 5, lines 34-35; specifically, packet scheduling (equal, weighted, etc.) is accomplished by using a more efficient memory solution and is especially useful in high-speed links/processing, col. 5, lines 34-39]**, comprising:

assigning received data packets to each of a plurality of priority levels, prioritizing the data packets within each level according to a first prioritization scheme **[on the ingress side, the received packets go through a filtering process wherein the packets are classified based on protocol fields wherein priority mapping is executed, col. 31, lines 18-24; *see also* Fig. 22, col. 32, lines 57-67]**;

prioritizing among the levels according to a second prioritization scheme and transmitting a highest priority one of the data packets **[a traffic conditioning metric is utilized to perform packet flow control on each individual COS queue on each individual egress in order to transmit the highest priority packet, col. 37, lines 43-61, this can be accomplished using strict prioritization (claim 23), col. 38, lines 25-30; or by using weighted fair queuing (claim 21), col. 38, lines 31-35; moreover, real-time**

applications are implemented with maximum latency parameters which only handle packets within defined anticipated arrival/departure times or be dropped (claim 22), col. 38, lines 35-41].

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(a) Parruck (USP 6,069,893), Asynchronous transfer mode switching architectures having connection buffers.

(b) Parruck (USP 6,229,812) Scheduling techniques for data cells in a data switch.

(c) Narayana et al. (USP 6,469,983), Data packet scheduling using a partitioned heap.

(d) Narayana et al. (USP 6,577,635) Data packet transmission scheduling.

(e) Kelly et al. (USP 6,804,199), Communication network system and method for routing based on disjoint pairs of paths.

(f) Kelly et al. (USP 6,542,469), Communications network system for routing based on disjoint pairs of path.

(g) Quay et al. (USP 6,115,360), Fair scheduling of ATM cell transmissions during overscheduled conditions.

(h) Rexford et al. (USP 6,633,544), Efficient precomputation of quality-of-service routes.

(i) Nadj et al. (USP 7,007,021), Data structure and method for pipeline heap-sorting.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Mais whose telephone number is 572-272-3138. The examiner can normally be reached on M-Th 5am-4pm.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAM
June 28,2006

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